

## **NATURAL SETTING**

### **Physiography**

Sampson County is located in the Coastal Plain of North Carolina, the emerged portion of the Atlantic Plain. The Coastal Plain experienced many alterations of land and sea, with accompanying accumulation of sediments. Inland toward the older land, the gradient gradually steepens and tributary streams increase in number and size. The Coastal Plain consists of Pleistocene terraces, which generally correlate in age with glacial invasions (Fenneman 1938).

These relict coastal terraces and scarps survive with varying degrees of preservation. The scarps that separate the terraces average 2.5 degrees in slope and 4.6 to 6 m in height (Maddry 1979). The site area is located on the Chowan plain, which borders the South and Black rivers above their junction in the southern tip of Sampson County along the border with Bladen County. This plain extends for some distance above the junction and has elevations of approximately 30 to 50 feet. It meets the Wicomico terrace at a well-defined scarp (Clark et al. 1912).

### **Geology**

The project area is underlain by the Black Creek Formation, which is Cretaceous in age (NCGS 1985). It is largely composed of thinly laminated sand and clay. The clay is often dark due to large portions of carbon, and lignite is common. The upper part contains abundant marine fauna within calcareous greensand and marine clay. The bedded and cross-bedded sands, clays, and lignites were probably deposited in shallow seas or in bays and estuaries while the calcareous deposits in the upper portion suggest deeper sea water (Stuckey and Conrad 1958).

### **Soils**

The soil found at site 31SP300\*1\* is Chipley sand, which has a slope of 0 to 2 percent. It is a moderately well drained soil that is nearly level and is found on low, smooth ridges. The soil has rapid permeability and low available water capacity with slow surface runoff. It is very strongly to strongly acid. The site, as well as most of the areas possessing this soil type, is covered by woodlands. The Sampson County soil survey describes the surface layer as typically being dark grayish brown sand six inches thick on top of a yellowish brown sand subsoil which is twenty inches thick (Brandon 1985). This describes the majority of the site.

### **Hydrology**

Most of Sampson County is in the Cape Fear River Basin. Water in the Goshen Swamp watershed flows eastward into the Black River. Many creeks and rivers surround

the swamps, which are found in flat or slightly depressed areas. Large bays and pocosins are found in the northwestern portion of the county, as well as in the southern tip (Brandon 1985).

The site is located along the west bank of the Black River, which flows southeast into the Cape Fear River, which in turn flows into the Atlantic Ocean. The river is approximately 50 m wide at the site location.

At Clear Run, wells have been drilled into the sand beds of the Black Creek formation at depths of 70 to 120 feet below the surface. Where the Black Creek formation lies close to the surface, more shallow open wells have been drilled at Clear Run into the lignitic sections which contain iron sulphide. Water that comes into contact with this iron sulfide is unfit for drinking (Clark et al. 1912).

## **Hurricanes**

Several hurricanes have hit Sampson County since 1875. Hazel, the most destructive hurricane recorded in North Carolina, devastated the state on October 15, 1954. Observers in nearby Faison, in Duplin County, estimated winds at 120 mph. Hurricane Donna struck North Carolina on September 11, 1960. It was a category three storm when it crossed into North Carolina and spawned a tornado in Sampson County (Barnes 1995). Hurricane Diana reached North Carolina on September 13, 1984, and was the first significant hurricane to hit the coast since Donna. The National Weather Service of Wilmington recorded 13.72 inches of rain from September 11 to 14, and the torrential rains associated with Diana caused dam failure in Roseboro in southern Sampson County (Barnes 1995). More recently, on September 5, 1996, Hurricane Fran caused extensive damage along the North Carolina coast. The damage from this storm is still visible throughout Sampson County as well as in other parts of the state. Sampson County's many swampy bogs could not support the larger trees during the high winds and, consequently, many were toppled.

Flooding on the Black River during these hurricanes as well as during other strong storms would have either washed away or deposited sediments at 31SP300\*1\*, as is evident from inspection of some of the site components.

## **Vegetation**

The Southeastern Evergreen Forest Region is essentially coextensive with the Coastal Plain physiographic region. The most prominent feature is the preponderance of evergreen trees. The longleaf pine forests of the sandy uplands dominate the landscape of much of the Coastal Plain. This forest is an edaphic climax modified and stabilized by recurring fires to the point that it is considered a fire subclimax (Braun 1950).

The natural vegetation of the region consists of a variety of very different forest communities: coniferous, mixed coniferous and hardwood, deciduous hardwood, and

mixed deciduous and broad-leaved evergreen hardwoods. These communities are interrupted by swamps, bogs, and prairies. The bays or shrub-bogs have a floristic composition that is part of the Subtropical Evergreen Forest rather than the Deciduous Forest formation (Braun 1950).

The most prevalent trees found in the Chipley sand soil are loblolly and slash pines. The existing understory consists of greenbrier, panicum, turkey oak, and annual forbs (Brandon 1985). The site was covered in vines and undergrowth that had to be cleared prior to excavation. Root disturbance from this vegetation greatly slowed excavation and reduced visibility of features close to the surface.

## **Climate**

Recent work along the Black River in Sampson County has utilized tree ring data from bald cypress trees. These trees are at least 1,700 years old and have been identified as the oldest trees in eastern North America (Stahle et al. 1988). Examination of the growth rings allowed reconstruction of the rainfall trends over the last 1,700 years. The data indicate that several long droughts occurred during the Medieval Warm Epoch (A.D. 1000-1300), with relatively wetter conditions during the beginning of the Little Ice Age (approximately A.D. 1300-1600). During the later stages of the Little Ice Age (1650-1750), early summers appeared to have become drier. In addition to these broad trends, the rainfall pattern has oscillated between wet and dry regimes which last about 30 years each (Stahle et al. 1988).